

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 06-179554
 (43)Date of publication of application : 28.06.1994

(51)Int.CI.

B65H 23/195
 B65H 35/07
 // B65H 18/28

(21)Application number : 04-332797

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(22)Date of filing : 14.12.1992

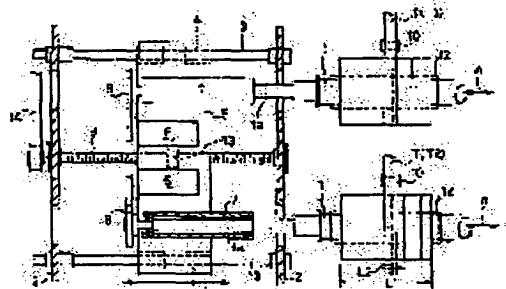
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(54) METHOD AND DEVICE FOR WINDING UP TAPE

(57)Abstract:

PURPOSE: To wind up the tape in a beautiful winding shape without winding slippage and wind up the tape by setting the winding-up width to the equal value in winding up the tape on a number of winding shafts simultaneously.

CONSTITUTION: A tape winding-up device is provided with a ball screw for traverse which is used to reciprocate a winding shaft 1 in the axial direction, and a computing means to control the traverse width and the lap width of the tape by controlling a motor for traverse by computing the rotation pulse of a winding-up motor 6 and the rotation pulse of a traverse motor. When the traverse winding-up of the tape is executed on a plurality of winding shafts 1 simultaneously, a plurality of ball screws for traverse which are used to reciprocate the respective winding-up shaft 1 in the axial direction are driven by one motor for traverse, and at the same time, the winding-up diameter of the tape on the respective winding-up shaft 1 is measured, and the optimum value is fed back to the motor for traverse.



LEGAL STATUS

[Date of request for examination] 14.12.1992

[Date of sending the examiner's decision of rejection] 25.06.1996

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection] 08-12297

[Date of requesting appeal against examiner's decision of rejection] 25.07.1996

[Date of extinction of right]

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CLAIMS

[Claim(s)]

[Claim 1] How to roll round the tape characterized by carrying out traverse winding of the tape by making it rotate, arranging the guide roll of a tape in the shape of stationing, and making shaft orientations carry out both-way movement of the paper winding shaft.

[Claim 2] The take-up motion of the tape characterized by what is characterized by providing the following. The paper winding shaft installed possible [both-way movement to shaft orientations]. The tape-guide roll installed in the shape of stationing to this paper winding shaft. The motor for winding for rotating the above-mentioned paper winding shaft. An operation means to control the traverse width and lap width of a tape by calculating the ball screw for a traverse for making shaft orientations carry out both-way movement of the above-mentioned paper winding shaft, the motor for a traverse for making this ball screw for a traverse drive, and the rotation pulse of the aforementioned motor for winding and the rotation pulse of the motor for a traverse, and controlling the aforementioned motor for a traverse.

[Claim 3] The take-up motion of the tape characterized by what is characterized by providing the following. Two or more paper winding shafts installed possible [both-way movement to shaft orientations]. The tape-guide roll installed in the shape of stationing for every paper winding shaft. Two or more motors for winding for rotating each paper winding shaft. Two or more ball screws for a traverse for making shaft orientations carry out both-way movement of each paper winding shaft, One motor for a traverse for making two or more of these ball screws for a traverse drive, An operation means to control the traverse width and lap width of a tape by calculating the rotation pulse of the aforementioned motor for winding, and the rotation pulse of the motor for a traverse, and controlling the aforementioned motor for a traverse, The operation means for measuring the diameter of winding of the tape in each paper winding shaft, and making an optimum value feed back to the aforementioned motor for a traverse.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] this invention relates to how to roll round the tape by the traverse winding method rolled round continuously, and forward-tape-wind-without-data-read-without-machine-functions equipment, shifting tapes, such as the tape cut out by narrow-width [suitable], for example, the tape which gave an adhesive tape and printing, and a carrier tape for tape automated bonding, from a wide film original fabric to shaft orientations to a paper winding shaft.

[0002]

[Description of the Prior Art] By the former, when a tape was rolled round with a traverse winding method, to the paper winding shaft which is carrying out high-speed rotation, both-way movement (traverse) was carried out to the shaft orientations of a paper winding shaft, and traverse winding of the guide roll of a tape was carried out to them so that it might see, for example to JP,62-60336,B. So, it will have a tape just before being rolled round by the paper winding shaft with a guide roll, and it will always be compulsorily shaken and moved to a longitudinal direction (shaft orientations of a paper winding shaft). Therefore, a tape not only cannot roll round to a **** clean with butter, but when excessive, the tape broke, and it bent, or it reversed, and became a defective, and since the tension which starts a tape whenever a tape is moreover shaken and moved to right and left always changed, there was fault which is easy to start weaving (strike slip).

[0003]

[Problem(s) to be Solved by the Invention] how to roll round a tape and the forward-tape-wind-without-data-read-without-machine-functions equipment which can similarly arrange the rolling-up lap width of the tape in each paper winding shaft, and can roll it round in case a rolling-up side is flat, and it can roll round just, without carrying out weaving (strike slip) and it moreover rolls round simultaneously to many paper winding shafts, while this invention is made in view of such conventional fault and a tape can roll round in a beautiful volume figure [be / no ***** crease ***** squirrel ***** with butter] -- it is going to provide -- it

[0004]

[Means for Solving the Problem] How to roll round the tape of this invention of attaining the **** purpose is characterized by carrying out traverse winding of the tape by making it rotate, arranging the guide roll of a tape in the shape of stationing, and making shaft orientations carry out both-way movement of the paper winding shaft. Moreover, the paper winding shaft which installed the take-up motion of the tape concerning this invention possible [both-way movement to shaft orientations], The tape-guide roll installed in the shape of stationing to a paper winding shaft, and the motor for winding for rotating a paper winding shaft, The ball screw for a traverse for making shaft orientations carry out both-way movement of the paper winding shaft, The motor for a traverse for making this ball screw for a traverse drive, It consists of an operation means to control the traverse width and lap width of a tape by calculating the rotation pulse of the aforementioned motor for winding, and the rotation pulse of the motor for a traverse, and controlling the aforementioned motor for a traverse. Moreover, in case traverse winding of the tape is simultaneously carried out to two or more paper winding shafts, while making two or more ball screws for a traverse for making shaft orientations carry out both-way movement of each paper winding shaft drive by one motor for a traverse It is characterized by coming to have an operation means for measuring the diameter of winding of the tape in each paper winding shaft, and making an optimum value feed back to the aforementioned motor for a traverse.

[0005]

[Example] Hereafter, the example of this invention is explained based on a drawing. One in drawing is a paper winding shaft, and is installed possible [both-way movement to shaft orientations]. Namely, the base board 5 is made to install in the guide bar 3 constructed over the machine frame 2 in the shape of level free [a slide] through guide pin bushing 4. The tubed bearing 7 for supporting to revolve free [rotation of the motor 6 for winding and paper winding shaft 1

for rotating a paper winding shaft 1] is installed in the shape of parallel on the base board 5, and it is end face side of paper winding shaft 1a to the above-mentioned tubed bearing 7. While making it support to revolve in the shape of **** End face side of paper winding shaft 1a Shaft orientations (Arrow n shows) are made to carry out both-way movement of the paper winding shaft 1 by making the above-mentioned motor 6 for winding coordinate through a belt 8, having the base board 5 with the ball screw 9 for a traverse, and carrying out both-way movement along with a guide bar 3.

[0006] In addition, although two tubed bearing 7 for paper winding shafts and motors 6 for winding were made to install on one base board 5, you may make it make the tubed bearing 7 for paper winding shafts, and at least one motors [three or more] 6 for winding install respectively on one base board 5 in the illustration example.

[0007] Moreover, the guide roll 10 of Tape T is installed in the shape of stationing. That is, although the guide roll 10 is attached in the point of the arm 11 installed in the machine frame 2 free [rocking] towards the method of paper winding shaft 1 and it rocks to the hoop direction of a paper winding shaft 1 as shown in drawing 3, it installs so that it may not move to the shaft orientations of a paper winding shaft 1 (to letter of stationing).

[0008] In addition, the sensor (not shown) for rolling round to a paper winding shaft 1, and detecting the outermost periphery position of the inner tape T, namely, observing the diameter of a volume of a tape is installed in the arm 11 which is supporting the guide roll 10, and it sets to it free [attachment and detachment of the paper tube 12 for making Tape T wind around the periphery of a paper winding shaft 1 directly].

[0009] And the base board 5 which is supporting the paper winding shaft 1 is made to coordinate the ball screw 9 for a traverse for making shaft orientations carry out both-way movement of the paper winding shaft 1 through the nut 13 for ball screws attached in the inferior surface of tongue, and the ball screw 9 for a traverse is made to coordinate the motor 15 for a traverse in which a right reverse rotation change is free through the transfer belt 14.

[0010] At this time, they are a tape T1, and T2, --, Tn in each paper winding shafts 1 and 1 and every -- by making it rotate, making shaft orientations carry out both-way movement of many paper winding shafts 1 and 1 and -- which made the tape-guide roll 10 arrange in the shape of stationing respectively, respectively, as shown in drawing 3. Even when carrying out traverse winding simultaneously Two or more ball screws 9 and 9 for a traverse for making shaft orientations carry out both-way movement of each paper winding shafts 1 and 1 and -- -- Two or more transfer belts 14 and 14 It has by one motor 15 for a traverse through --, and is made to make it drive.

[0011] In addition, drawing 3 is a tape T1, and T2, --, Tn in every many paper winding shaft 1 and 1 and --. The equipment which carries out traverse winding simultaneously is expressed typically. The guide roll 10, an arm 11, a dancer roll 16, and a nip roll 17 are illustrated only about three paper winding shafts 1 located in a right end in a drawing. About each of other paper winding shafts 1 and 1 and --, they are nip rolls 17 and 17. Only -- was illustrated and the publication of the guide roll 10, an arm 11, and a dancer roll 16 was omitted.

[0012] The wide film which **(ed) and was sent out from the film original fabric 18 As shown in drawing 3, after having by the cutter 19 and being judged in the shape of [suitable / narrow-width] a tape, the distribution roll 20 -- passing -- a tape T1, and T2, --, Tn every -- it is distributed and traverse winding is carried out through the dancer-roll 16 -> guide roll 10 one by one simultaneous [each paper winding shafts 1 and 1 and --] to a paper tube 12 from the nip roll 17 made to install in each paper winding shafts 1 and 1 and every --, respectively

[0013] Next, operation of the equipment applied to this invention focusing on the mechanism block diagram shown in drawing 4 is explained. At the same time it transmits rotation of the motor 6 for winding to a paper winding shaft 1 through a belt 8 and rotates a paper winding shaft 1, after setting a paper tube 12 to a paper winding shaft 1 Rotation of the motor 15 for a traverse is told to the ball screw 9 for a traverse through the transfer belt 14. The hand of cut of the ball screw 9 for a traverse is rotated normally and reversed by carrying out the right reverse rotation change of the motor 15 for a traverse. Both-way movement (traverse) of the paper winding shaft 1 is carried out to shaft orientations through the base board 5 which moves to right and left with change of the hand of cut. the letter of stationing -- and traverse winding of the tape T is carried out to paper tube 12 periphery of a paper winding shaft 1 through the nip-roll 17 -> dancer-roll 16 -> guide roll 10 made to arrange in the shape of a straight line one by one

[0014] Under the present circumstances, while having in the tape T by which traverse winding is carried out to a paper winding shaft 1 by the dancer roll 16 and applying a necessary tension, the arm 11 which is supporting the guide roll 10 is rolled round with the guide roll 10, fixed maintenance of the interval with the outermost periphery of an inner tape is always carried out, it has [it has by *****, and] it by the fixed tension, and it is rolled round by the paper tube 12. And operation (rotation rocking angle) of these guide roll 10 and a dancer roll 16 is potentiometers 21 and 22, respectively. It is let pass and observed. In addition, 16in drawing a It is a dancer cylinder for controlling a dancer roll 16.

[0015] Moreover, traverse width L1 of Tape T (rolling-up width of the tape T to a paper tube 12) And the amount L2 of leads (the amount of staggering of the tape T per paper winding shaft 1 rotation), i.e., lap width, (lap width with the

tape rolled previously) It is controlled by operation means to calculate the rotation pulse of the motor 6 for winding, and the rotation pulse of the motor 15 for a traverse, and to control the motor 15 for a traverse.

[0016] That is, they are pulse oscillators 23 and 24 to the motor 6 for winding, and the motor 15 for a traverse, respectively. And servo drivers 25 and 26 You make it connect. While making a command pulse and voltage feed back respectively and performing closed loop control Make a counting-down circuit 27 connect and dividing of the rotation pulse of MOTATA 6 for winding is carried out to the motor 6 side for winding with a counting-down circuit 27. With the rotation pulse of the motor 15 for a traverse, input into CPU28 (arithmetic and program control), and the comparison operation of both the rotation pulse is carried out. By making the variation feed back to the motor 15 for a traverse, and controlling rotation of the motor 15 for a traverse, it is the traverse width L1 of Tape T. And lap width L2 It sets up and changes.

[0017] For example, pulse oscillators 23 and 24 of the motor 6 for winding, and the motor 15 for a traverse For operation 1000/1 rotation Foundations and nothing, If the amount b of leads is set as 3mm with a control panel 29 to carry out traverse winding of the tape T with a width of 10mm by lap width of 7mm Whenever the division ratio of a counting-down circuit 27 is set to one third and the motor 6 for winding rotates one time, 1000 pulses are sent to CPU28. Since a comparison operation with the rotation pulse sent from the pulse oscillator 24 of the motor 15 for a traverse is performed and a deflection signal is sent from CPU28 As a result of the motor 15 for a traverse rotating 3/10 based on the deflection signal, a paper winding shaft 1 moves to shaft orientations 3mm, and traverse winding with a lap width of 7mm is performed.

[0018] moreover, in setting up the traverse width of this tape T It is 100mm about the traverse width a with a control panel 29. If the halt rotational frequency c in an edge is suitably set up by return while setting The pulse signal from the motor 15 for a traverse is sent to CPU28. The motor 15 for a traverse rotates in the right direction, and a paper winding shaft 1 is moved in the right direction (outward trip) until the pulse number oscillated from the motor 15 for a traverse is set to 0 from 20.000 pieces. If a value is set to 0, rotation of the motor 15 for a traverse will be reversed, an opposite direction is made to rotate the ball screw 9 for a traverse until the pulse number oscillated from the motor 15 for a traverse becomes 20.000 pieces, and it comes to move a paper winding shaft 1 to an opposite direction (return trip).

[0019] toward [so that it may roll round covering / when rolling round the tape whose thickness is not uniform like the tape which gave an adhesive tape and printing on the other hand / the whole traverse width and a field may become flatness-like] the volume edge of a paper winding shaft 1 (paper tube 12) to a center section (the length position of the half of a paper tube 12), lap width is gradually made large or traverse winding is conversely carried out with slight straitness (an inclination volume is called) -- it is made like

[0020] Namely, with a control panel 29, supposing it sets [10mm and the amount b of leads] 10mm and the tape width e as 10mm for 5mm and the inclination width d, respectively, for example, the traverse width a The motor 15 for a traverse does not rotate 1 pulse eye oscillated from the motor 6 for winding at the volume edge of a traverse (the amount 0 of leads). if the one following pulse is inputted -- the motor 15 for a traverse -- a part for 1.25 pulses, 1.25/1000 [i.e.,], -- rotating -- a paper winding shaft 1 -- shaft orientations -- 0.00625mm It moves. furthermore -- if the one following pulse is inputted -- the motor 15 for a traverse -- 2.5 Namely, rotate 2.5/1000 and a paper winding shaft 1 moves to shaft orientations 0.0125mm. a part for a pulse -- Thus, an inclination volume is carried out for 10mm which the amount of leads increases gradually and goes to a center section from the volume edge of the traverse of lap width with slight straitness.

[0021] in addition -- since processing of a pulse is treated integrally in fact -- for example, the 1.25/1000 above-mentioned rotation -- 1/800 it is -- Moreover, 2.5/1000 rotation is 1/400. It becomes. Finally, it is 5/1000 rotation, 1/200 [i.e.,]. A molecule is set to 1 so that it may become, and it is a denominator 800 Shell 200 It is the thing to which the amount of leads is made to increase gradually by performing data processing which reduces a denominator for every input pulse of a paper winding shaft until it becomes. Conversely, it is a denominator 200 Shell 800 It increases, and if it goes, the inclination volume which decreases the amount of leads gradually can be performed until it becomes.

[0022] Moreover, they are a tape T1, and T2, --, Tn to two or more paper winding shafts 1 and 1 and --. If two or more ball screws 9 for a traverse are made to drive by one motor 15 for a traverse in case traverse winding is carried out simultaneously Since the lap width of a tape may change with each paper winding shafts 1 and 1 and -- Each paper winding shafts 1 and 1, the tape T1 in --, and T2, --, Tn So that the amount of leads, i.e., rolling-up lap width, may become the same Each paper winding shafts 1 and 1, the tape T1 in --, and T2, --, Tn It controls using an operation means to measure the diameter of winding and to make an optimum value feed back to the motor 15 for a traverse.

[0023] Namely, operation (rotation rocking angle) of each arm 11 which is supporting each paper winding shafts 1 and 1 and the guide roll 10 installed in every -- is observed by the potentiometer 22. Each paper winding shafts 1 and 1, the

tape T1 in --, and T2, --, Tn The diameter of winding is measured. Make the diameter of winding input into operation part 30, respectively, and it is based on the result of an operation in operation part 30 of each paper winding shafts 1 and 1 and --. Each paper winding shafts 1 and 1, the tape T1 in --, and T2, --, Tn It is made to connect with the paper winding shaft 1 which had an overall diameter, a diameter of the minimum, or optimum values for which it asks, such as pitch-diameter etc., among the diameters of winding electrically. By having and carrying out data processing of the rotation pulse of a paper winding shaft 1 and the rotation pulse of the motor 15 for a traverse with the optimum value by CPU28, and making them feed back to the motor 15 for a traverse Each paper winding shafts 1 and 1, the tape T1 in --, and T2, --, Tn The amount of leads, i.e., rolling-up lap width, is arranged identically.

[0024]

[Effect of the Invention] how to roll round the tape of this invention -- ** -- since it was made to carry out traverse winding in a tape by making it rotate, arranging the guide roll of a tape in the shape of stationing, and making shaft orientations carry out both-way movement of the paper winding shaft like, along with the supply line (nip-roll -> dancer-roll -> guide roll) of a tape, it results to a guide roll in the shape of a straight line, and a tape is rolled round by the paper winding shaft, having and being stably held with a guide roll Therefore, ***** crease ***** Japanese common chestnut ***** squirrel ***** with butter of a tape can completely be lost, it can reduce the incidence rate of a defective sharply, and can roll round in the beautiful volume figure in which goods value is high.

[0025] And since shake a tape just before being rolled round by the paper winding shaft and it is not moved to right and left, even when rolling round the tape on which the tension concerning a tape hardly changed, therefore an adhesive tape and printing with uneven thickness were given, it rolls round covering a paper tube overall length, a field is flat, and it can roll round just, without carrying out weaving (strike slip).

[0026] Moreover, according to the take-up motion according to claim 2 which embodied the above-mentioned winding method, it can add to the operation effect mentioned above, and the traverse width and lap width of a tape can be set up and changed that it is simple and freely.

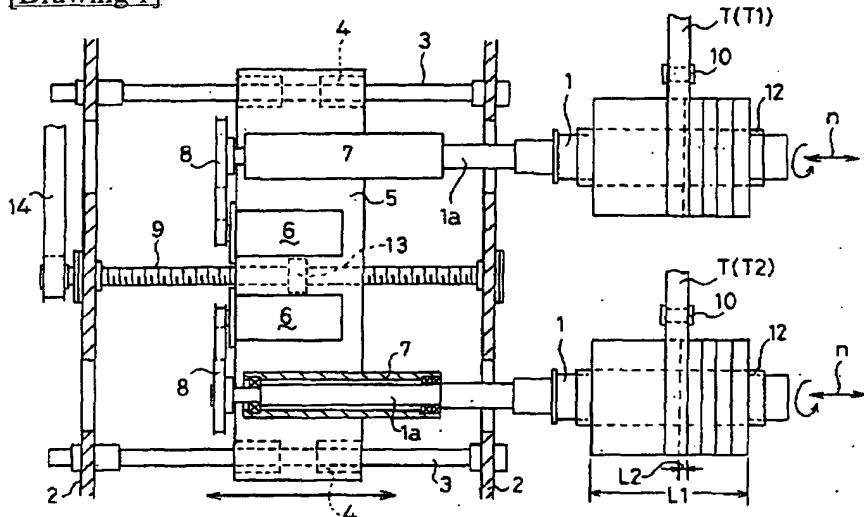
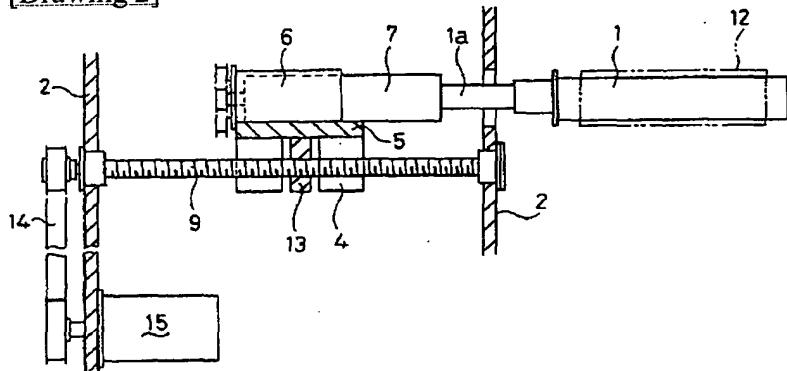
[0027] furthermore, since both-way movement of many paper winding shafts can be carried out [according to the take-up motion according to claim 3] by one motor for a traverse in addition to the operation effect mentioned above While being able to assemble many paper winding shafts cheaply [equipment becomes simple and] and being able to manufacture them by each motor for a traverse as compared with the case where both-way movement is carried out A majority of each paper winding shafts can be controlled easily, the rolling-up lap width in each paper winding shaft can be arranged identically, and a tape with high goods value can be offered in large quantities at once.

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DRAWINGS**[Drawing 1]****[Drawing 2]****[Drawing 3]**